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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UK

Office Action Summary	Application No.	Applicant(s)	
	09/972,911	AU ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 3-7, 9, 10, 12-6, 18, 19 and 21-24 are rejected under 35 U.S.C. 102(a) as being anticipated by Rajagopalan et al. ("Rajagopalan") ("IP over optical networks: architectural aspects"; Rajagopalan et al.; IEEE Communications Magazine, Vol. 38, Issue 9, Sept. 2000; Pages 94-102).

Regarding claim 1, Rajagopalan discloses a virtual photonics switching system, the system comprising, multiple photonics network elements comprising photonics network nodes and photonics network switches and optical fibers connecting the photonics network elements (fig. 1 and page 94, cols. 1 and 2, section "Introduction"); and an O-UNI server optically connected to at least one of the network elements (page 99, col. 1, first paragraph of section "Route Computation" and page 99, col. 2, second full paragraph, where Rajagopalan discloses a source port OXC computing the route, as well as the concept of a centralized route server for route computation – therefore, a centralized route server at said OXC – and discloses a request for path establishment traveling over an O-UNI, which indicates that the server responsible for establishing the path is an O-UNI server; thus Rajagopalan discloses a centralized O-UNI server OXC, which is optically connected to the other network elements) including: at least one memory for storing information pertaining to photonics network nodes registered with the server (page 99, col. 2, second full paragraph, where a server with "complete knowledge of link state and path routes" indicates an inherent memory for storing the information); a communication

circuit for receiving a connectivity request from a first registered photonics network node for a connection with a second registered photonics network node (page 99, col. 1, first paragraph of section "Route Computation"); and connection logic for determining compatibility of the first and second registered photonics network nodes (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations); the communications circuit providing instructions to photonics network switches upon verifying compatibility of the first and second registered photonics network nodes to search for an end-to-end wavelength path (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" also indicates searching for an end-to-end wavelength path in light of compatibility) and establish the connection between the first registered photonics network node and the second registered photonic network node (page 99, col. 2 to page 100, col. 2, section "Path Establishment").

Regarding claim 3, Rajagopalan discloses the system of claim 1, wherein the connection logic determines technology compatibility (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations).

Regarding claim 4, Rajagopalan discloses the system of claim 1, wherein the photonics network nodes include photonics network service nodes and photonics network access nodes (fig. 1 and page 94, section "Introduction").

Regarding claim 5, Rajagopalan discloses the system of claim 4, wherein the photonics network service nodes comprise core routers or video servers (fig. 1 and page 94, section "Introduction", where intelligent optical core OXCs are "core routers").

Regarding claim 6, Rajagopalan discloses the system of claim 4, wherein the photonics network access nodes comprise multiplexers or edge routers (page 94, col. 2 to page 95, col. 2, section "Interconnection Models", specifically "IP routers at the edge of the optical networks").

Regarding claim 7, Rajagopalan discloses the system of claim 1, wherein the O-UNI server further comprises fault management tools for determining when an error has occurred in establishing the connection (page 100, col. 2, section "End-to-End Restortion").

Regarding claim 9, Rajagopalan discloses the system of claim 1, wherein the O-UNI server further comprises registration tools for registering photonics network nodes and collecting information including number of ports, wavelengths per port, and bandwidth per wavelength (page 97, col. 2 to page 98, col. 1, section "Terminology" and page 99, col. 1, section "Link State Update", where the "central controller" is the O-UNI in light of page 99, section "Route Computation").

Regarding claim 10, Rajagopalan discloses a method for establishing automatic service connectivity in a network between multiple photonics network elements (page 94, section "Introduction", where intelligent, dynamic provisioning and restoration indicates automatic service connectivity), and comprising photonics network nodes and photonics network switches connected by optical fibers, each optical fiber carrying multiple wavelengths of signals (fig. 1 and page 94, section "Introduction" and page 97, col. 1 to page 98, col. 2, section "Terminology"), wherein the photonics network elements optically communicate with an O-UNI server (page 99, col. 1, first paragraph of section "Route Computation" and page 99, col. 2, second full paragraph, where Rajagopalan discloses a source port OXC computing the route using link state information, where link state information is communicated by the network elements, as well as the concept of a centralized route server for route computation – therefore, a centralized route server at said OXC – and discloses a request for path establishment

traveling over an O-UNI, which indicates that the server responsible for establishing the path is an O-UNI server; thus Rajagopalan discloses a centralized O-UNI server OXC, which is optically connected to the other network elements), the method comprising: registering photonics network nodes by collecting information about each photonics network element node (page 99, col. 2, second full paragraph, where a server with "complete knowledge of link state and path routes" indicates a server registering and collecting information about each network element based on the link state information); storing information pertaining to each registered photonics network node at the O-UNI server (page 99, col. 2, second full paragraph, where a server with "complete knowledge of link state and path routes" indicates an inherent memory for storing the information); receiving a connectivity request from a first registered photonics network node for a connection with a second registered photonics network node (page 99, col. 1, first paragraph of section "Route Computation"); determining compatibility of the first and second registered photonics network nodes (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations); and instructing photonics network elements switches upon verifying compatibility of the first and second registered photonics network nodes to search for an end-to-end wavelength path (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" also indicates searching for an end-to-end wavelength path in light of compatibility) and establish a connection between the first registered photonics network node and the second registered photonics network node (page 99, col. 2 to page 100, col. 2, section "Path Establishment").

Regarding claim 12, Rajagopalan discloses the method of claim 10, wherein the step of determining compatibility comprises determining technology compatibility (page 99, col. 1, first

and second paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations).

Regarding claim 13, Rajagopalan discloses the method of claim 10, further comprising using photonics network service nodes and photonics network access nodes as the photonics network nodes (fig. 1 and page 94, section "Introduction").

Regarding claim 14, Rajagopalan discloses the method of claim 13, further comprising providing core routers or video servers as photonics network service nodes (fig. 1 and page 94, section "Introduction", where intelligent optical core OXCs are "core routers").

Regarding claim 15, Rajagopalan discloses the method of claim 13, further comprising providing multiplexers or edge routers as photonics network access nodes (page 94, col. 2 to page 95, col. 2, section "Interconnection Models", specifically "IP routers at the edge of the optical networks").

Regarding claim 16, Rajagopalan discloses the method of claim 10, further comprising performing fault management for determining when an error has occurred in establishing the connection (page 100, col. 2, section "End-to-End Restortion").

Regarding claim 18, Rajagopalan discloses the method of claim 10, wherein the step of registering photonics network anodes comprises collecting information including number of ports, wavelengths per port, and bandwidth per wavelength (page 97, col. 2 to page 98, col. 1, section "Terminology", and page 99, col. 1, section "Link State Update", where the "central controller" is the O-UNI in light of page 99, section "Route Computation").

Regarding claim 19, Rajagopalan discloses an O-UNI server (page 99, col. 1, first paragraph of section "Route Computation" and page 99, col. 2, second full paragraph, where Rajagopalan discloses a source port OXC computing the route, as well as the concept of a centralized route server for route computation – therefore, a centralized route server at said

OXC – and discloses a request for path establishment traveling over an O-UNI, which indicates that the server responsible for establishing the path is an O-UNI server; thus Rajagopalan discloses a centralized O-UNI server OXC, which is optically connected to the other network elements) adaptable for use in a virtual photonics switching system having a plurality of photonics network elements comprising photonics network nodes and photonics network switches (fig. 1 and page 94, cols. 1 and 2, section "Introduction"), the O-UNI server comprising: at least one memory for storing information pertaining to each photonics network node registered with the O-UNI server (page 99, col. 2, second full paragraph, where a server with "complete knowledge of link state and path routes" indicates an inherent memory for storing the information); a communication circuit for receiving a connectivity request from a first registered photonics network node for a connection with a second registered photonics network node (page 99, col. 1, first paragraph of section "Route Computation"); and connection logic for determining compatibility of the first and second registered photonics network nodes (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations); the communications circuit providing instructions to photonics network element switches upon verifying compatibility of the first and second registered photonics network nodes to search for an end-to-end wavelength path (page 99, col. 1, first and second paragraph of section "Route Computation", where "route computation with constraints" also indicates searching for an end-to-end wavelength path in light of compatibility) and establish the connection between the first registered photonics network node and the second registered photonics network node (page 99, col. 2 to page 100, col. 2, section "Path Establishment").

Regarding claim 21, Rajagopalan discloses the O-UNI server of claim 19, wherein the connection logic determines technology compatibility (page 99, col. 1, first and second

paragraph of section "Route Computation", where "route computation with constraints" indicates compatibility considerations).

Regarding claim 22, Rajagopalan discloses the O-UNI server of claim 19, further comprising fault management tools for determining when an error has occurred in establishing a the connection (page 100, col. 2, section "End-to-End Restortion").

Regarding claim 23, Rajagopalan discloses the O-UNI server of claim 19, further comprising registration tools for registering photonics network nodes and collecting information including number of ports, wavelengths per port, and bandwidth per wavelength (page 97, col. 2 to page 98, col. 1, section "Terminology", and page 99, col. 1, section "Link State Update", where the "central controller" is the O-UNI in light of page 99, section "Route Computation").

Regarding claim 24, Rajagopalan discloses the O-UNI server of claim 19, further comprising address management tools for address resolution and assignment (page 98, col. 1, section "Addressing" and fig. 4 and page 98, col. 2 to page 99, col. 1, section "Neighbor Discovery", in light of page 99, col. 1, section "Link State Update" and page 99, col. 2, second full paragraph, where neighbor discovery is used to populate the link state information tables, including addressing information, and where the centralized server uses the link state information for route computation).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 11 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajagopalan et al. ("Rajagopalan") ("IP over optical networks: architectural aspects"; Rajagopalan et al.; IEEE Communications Magazine, Vol. 38, Issue 9, Sept. 2000; Pages 94-102).

Regarding claims 2, 11 and 20, Rajagopalan discloses the system, method and O-UNI server of claims 1, 10 and 19, respectively wherein the O-UNI server computes a route based on link state information and a management system's request to establish a light path (page 99, col. 1, first paragraph of section "Route Computation" and col. 2, second full paragraph), but does not explicitly disclose that the O-UNI server further comprises a web menu for providing a user with a selection of available services. The O-UNI server's management system's applications are not described in detail; however, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a web menu with the O-UNI's management system for requesting establishment of a light path, since HTML and web menu interfaces are well known for use as application interfaces for management system provisioning tasks performed by network operators.

5. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajagopalan et al. ("Rajagopalan") ("IP over optical networks: architectural aspects"; Rajagopalan et al.; IEEE Communications Magazine, Vol. 38, Issue 9, Sept. 2000; Pages 94-102) in view of Metz ("IP Over Optical"; Chris Metz; IEEE Internet Computing, November-December 2000; http://www.cisco.com/warp/public/779/servpro/solutions/optical/docs/ip_optical2-01.pdf) and further in view of Zhang et al. ("Zhang") ("Signaling Requirements at the Optical UNI"; Zhang et

al.; Internet Draft, 14 July 2000; http://www.cse.ohio-state.edu/~jain/ietf/ftp/draft-bala-mpls-optical-uni-signaling-00.txt).

Regarding claims 8 and 17, Rajagopalan discloses the system and method of claims 1 and 10, respectively, and discloses using OXCs and discloses neighbor discovery for nodes in the network, but does not explicitly disclose that the photonics network elements, the optical fibers, and the O-UNI server comprise a protocol agnostic private network provided that communicating photonics network nodes use an identical communication protocol. Metz discloses that a pure optical switch fabric does not perform O-E-O conversion and therefore it is independent of the signal format or bit rate of the data/payload of the optical signals (page 78, col. 2, last line to col. 3, line 12). It would have been obvious to one of ordinary skill in the art at the time of the invention to use pure optical switch fabrics for the OXCs of Rajagopalan, to provide the benefit of OXCs that operate independent of the signal format or bit rate of the data/payload of the optical signals. In this case, an OXC that operates independent of signal format and bit rate means that the OXC will effectively be using the identical communication protocol as the source/destination nodes, because it accepts whatever communication protocol may be used. Zhang discloses O-UNI signaling requirements and discloses user group identification of clients for the formation of closed user groups or VPNs of clients, where user group identifiers for each client-optical interface are registered during UNI neighbor discovery (section 5 "Identification of Lightpath Termination Points and User Groups"). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the user group identifiers of Zhang for the clients of the network of Rajagopalan in view of Metz, to provide the benefit of supporiting VPNs for clients.

6. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajagopalan et al. ("Rajagopalan") ("IP over optical networks: architectural aspects"; Rajagopalan et al.; IEEE Communications Magazine, Vol. 38, Issue 9, Sept. 2000; Pages 94-102) in view of Zhang et al. ("Zhang") ("Signaling Requirements at the Optical UNI"; Zhang et al.; Internet Draft, 14 July 2000; http://www.cse.ohio-state.edu/~jain/ietf/ftp/draft-bala-mpls-optical-uni-signaling-00.txt).

Regarding claim 25, Rajagopalan discloses the O-UNI server of claim 19, and discloses the O-UNI server in charge of lightpath creation (page 99, section "Route Computation") but does not disclose accounting management tools for managing data associated with service usage. Zhang discloses "user groups" as integral to lightpath establishment, including user group connectivity restrictions and security procedures (section 4, "Optical Network Services"), where user group connectivity restrictions indicate accounting management tools, and where security procedures for user groups indicate managing data associated with service usage. It would have been obvious to one of ordinary skill in the art at the time of the invention to use user groups in the O-UNI server lightpath services of Rajagopalan, to provide the benefit of a more securely managed network.

Regarding claim 26, Rajagopalan discloses the O-UNI server of claim 19, and discloses the O-UNI server in charge of lightpath creation (page 99, section "Route Computation") but does not disclose that the O-UNI server has security management tools for managing allocation and authentication of access passwords of the photonics network nodes. Zhang discloses "user groups" as integral to lightpath establishment, including user group connectivity restrictions and security procedures (section 4, "Optical Network Services"). It would have been obvious to one of ordinary skill in the art at the time of the invention to use user groups in the O-UNI server lightpath services of Rajagopalan, to provide the benefit of a more securely managed network.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention that user group connectivity restrictions and security procedures would include managing allocation and authentication of access passwords for the user groups, since password management as a form of group access control is well known in the art.

Response to Arguments

7. Regarding the applicant's arguments with respect to claims 1, 10, 19, and depending claims, the arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER